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09/930,389	08/15/2001	Venkata Ramana Rao Gadde	SRI/4544-2	9193

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EXAMINER

VO, HUYEN X

ART UNIT PAPER NUMBER

2655

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/930,389

**Applicant(s)**

GADDE, VENKATA RAMANA RAO

**Examiner**

Huyen Vo

**Art Unit**

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. Applicant has submitted an amendment filed 11/24/2004, amending claims 1, 3, , 7, 9, 13, and 15, while arguing to traverse the art rejection based on amended limitations (*see claim amendment*). Applicant's arguments have been considered but are not persuasive. However, Yamaguchi et al. (US 6026359)<sup>teach</sup> a noise model adaptation in a speech recognition system, which extracts noise intervals from the input speech signal for use in adapting existing noise model to improve speech recognition accuracy. Yamaguchi et al. also teach the step of deriving noisy speech models in accordance with a signal-to-noise ratio (*col. 14, line 30 to col. 15, line 5, S/N ratio is accounted in the derivation of a noisy speech model*). Therefore, previous ground of rejection is maintained.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless – (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 7-10, and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamaguchi et al. (US Patent No. 6026359).

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4. Regarding claims 1, 7, and 13, Yamaguchi et al. disclose a method, an apparatus, and computer-readable medium having instructions for performing speech recognition on an input audio signal having a speech component and a noise component, said method comprising the steps of: (a) obtaining at least one clean speech model (*Clean Speech HMM Memory Unit 4 in figure 3*); (b) obtaining at least one noise model (*output of Noise Extraction Unit 2 in figure 3*); (c) deriving at least one noisy speech model directly from said at least one clean speech model and said at least one noise model in accordance with signal-noise-ratio (*HMM Composition Unit 5 in figure 3*); and (d) applying said at least one noisy speech model to extract a recognized text from the input audio signal (*Speech Recognition Unit 12 in figure 3*).

5. Regarding claims 2, 8, and 14, Yamaguchi et al. further disclose that the obtaining step (b) comprises the step of estimating said at least one noise model from one or more features of the noise component in the input audio signal (*the noise extraction process in figures 3 or 5 is an estimation process*).

6. Regarding claims 3, 9, and 15, Yamaguchi et al. further disclose that the deriving step (c) comprises the step of: (c1) generating a weight in accordance with said signal-to-noise ratio (*Difference Calculation Unit 9 in figures 3 or 5, the difference between initial noise and current noise is considered as a weight*).

7. Regarding claims 4, 10, and 16, Yamaguchi et al. further disclose that the deriving step (c) further comprises the step of: (c2) applying said weight to said at least one noise model and said at least one clean speech model for deriving said at least one noisy speech model (*referring to equation 7 in col. 9, the difference between the current and the initial noise models is "multiplied" with the Jacobian matrix of representing of the original noisy speech model, what is composed of an original clean speech model and an initial noise model, to produce a new noisy speech model*).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5-6, 11-12, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (US Patent No. 6026359) in view of Komori et al. (US Patent No. 5956679).

10. Regarding claims 5-6, 11-12, and 17-18, Yamaguchi et al. do not disclose that the applying step (c2) applies said weight in a first multiplication operation to said at least one noise model and in a second multiplication operation to said at least one clean

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speech model; and the products from said multiplication operations are summed to derive said at least one noisy speech model.

However, Komori et al. teach that the applying step (c2) applies said weight in a first multiplication operation to said at least one noise model and in a second multiplication operation to said at least one clean speech model (*col. 6, ln. 1 to col. 7, ln. 25*), and the products from said multiplication operations are summed to derive said at least one noisy speech model (*element 605 in fig. 7*).

Since Yamaguchi et al. and Komori et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Yamaguchi et al. by incorporating the teaching of Komori et al. in order to produce effective noisy speech models to enhance recognition accuracy of the system.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose telephone number is 703-305-8665. The examiner can normally be reached on M-F, 9-5:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HXV

April 19, 2005

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SUSAN MCFADDEN  
PRIMARY EXAMINER